Space Weather Forecast

Issued on Wednesday, 21 September 2022 at 13:10 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Ongoing chance of Moderate flares/R1-R2 Radio Blackout. Minor or Moderate geomagnetic storm intervals likely from late day 2 into day 3 (22nd/23rd).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Moderate over the past 24 hours, with five sunspot regions on the disc and one Moderate class flare observed form the a sunspot region in the southeast. The main flare risk has transferred from AR3102 in the southwest, which appears to be weakening, to the southeast where AR3105 is close to new region AR3107. No Earth-directed CMEs (coronal mass ejections) were observed in the last 24 hours.
Solar Wind / Geomagnetic Activity: The solar continued at mainly slightly elevated levels with speeds of around 450-520 km/s. Its magnetic field strength remained weak however, with no notable periods with its north-south component pointed in a negative (southward) direction
Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was close to background levels, with no solar radiation storms.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain Low, with a chance of isolated Moderate flaring.
Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs. Slightly elevated solar winds are expected to gradually ease towards background, with the next enhancement expected either late day 2 (22nd) or day 3 (23rd) from a further coronal hole fast wind arrival. This is likely to give a period of elevated geomagnetic activity. Generally Quiet condition with isolated Unsettled spells expected until later day 2. There is the potential for activity to increase to Active to G1/Minor Storms, with a chance for G2/Moderate Storm intervals either late on day 2, or day 3 (22nd or 23rd). Conditions then easing to Quiet to Unsettled, with isolated Active spells through day 4 (24th).
Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to continue easing to background levels.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	40	60	20
Strong	G3	No	1	5	5	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	2	2	2
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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